

**Translation**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>H2012-01</b>	<b>FOR FURTHER ACTION</b> See Form PCT/IPEA/416	
International application No. <b>PCT/JP2004/000463</b>	International filing date (day/month/year) <b>21.01.2004</b>	Priority date (day/month/year) <b>22.01.2003</b>
International Patent Classification (IPC) or national classification and IPC <b>7</b>		
Applicant <b>HITACHI MAXELL, LTD.</b>		

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of _____ sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>5</u> sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>																									
<p>4. This report contains indications relating to the following items:</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>		<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input checked="" type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/000463

Box No. I

## Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-16 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. 2-5, 8-11, 14-17 \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 1, 6, 7, 13, 18, 19 received by this Authority on 18-11-2004
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- sheets 1/4-4/4 \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☒ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☒ the claims, nos. 12 \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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## Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application

☒ claims Nos. 6, 18, 19

because:

☐ the said international application, or the said claims Nos. \_\_\_\_\_  
relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. \_\_\_\_\_  
are so unclear that no meaningful opinion could be formed (*specify*):

☒ the claims, or said claims Nos. 6, 18, 19 are so inadequately supported  
by the description that no meaningful opinion could be formed.

☐ no international search report has been established for said claims Nos. \_\_\_\_\_

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

☒ See Supplemental Box for further details.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-5, 7-11, 13-17	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-5, 7-11, 13-17	NO
Industrial applicability (IA)	Claims	1-5, 7-11, 13-17	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
List of cited documents			
Documents 1-4 and 8 listed below are cited in the international search report.			
Documents 5-7 are newly cited documents.			
Document 1:	JP 2001-135304 A (Kyushu Electric Power Co., Inc.), 18 May 2001, claims 1 to 5; Paragraphs [0025] and [0026]; examples, (Family: none)		
Document 2:	JP 10-241683 A (Mitsubishi Cable Industries, Ltd.), 11 September 1998, claims 1 to 4; paragraphs [0007] to [0012]; examples, (Family: none)		
Document 3:	JP 8-180873 A (Sony Corp.) , 12 July 1996, claims 1 to 4; examples; table 1 (Family: none)		
Document 4:	JP 9-27314 A (Matsushita Electric Industrial Co., Ltd.), 28 January 1997, claims 1 to 4 ; paragraph [0009]; examples (Family: none)		
Document 5:	JP 2001-250536 A (Matsushita Electric Industrial Co., Ltd.), 14 September 2001, claims 1-3, entire description, (Family:		

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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none)

Document 6: 2002-246020 A (Sony Corp.), 30 August 2002, paragraphs 0111, 0112, etc., (Family: none)

Document 7: JP 2002-313323 A (Toyota Central research and Development Laboratories, Inc.), 25 October 2002, claims 1-4, examples, etc., (Family: none)

Document 8: JP 2000-138061 A (NEC Corp.), 16 May 2000, claim 1, paragraph 0026, (Family: none)

#### Explanation

Claims 1, 3-5, 7, 9-11, 13 and 15-17 do not involve an inventive step in the light of documents 1-7.

Documents 1-4 all disclose a lithium secondary battery that uses a mixture of spherical graphite and flat graphite as a negative electrode and suggest that the range of particle size overlaps with the range set forth in the present application. Although there is no specific disclosure relating to the concomitant use of a water-based resin and a rubber-based resin as the binder, the use of a water-based resin and a rubber-based resin as the binder in the negative electrode of lithium secondary battery is well-known, as suggested in documents 5-7.

Moreover, although there are no specific disclosures relating to the size of the crystallite along the c-axis, the tap density, parameters using the Raman spectral, and secondary particle size when particles become secondary particles, both the present invention and the inventions disclosed in documents 1-4 aim to achieve the effect of using several types of graphite of differing shape and

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

size concomitantly. Furthermore, if we examine the entire description of the present application, there is no disclosure suggesting an unexpected effect due to the size of the crystallite along the c-axis, the tap density, parameters using the Raman spectral, and secondary particle size when particles become secondary particles and, therefore, it appears that if measured, the carbon material disclosed in documents 1-4 would fulfil these conditions or that these conditions could be suitably derived as matters of design.

Claims 2, 8 and 14 do not involve an inventive step in the light of documents 1-8. The feature of coating the surface of the graphite material with a non-graphite carbon coating is known, as disclosed in document 7.

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

III.

Of the claims amended by the amendment submitted with the correspondence dated 18 November 2204, claims 6 and 18 introduce new subject matter relating to the coating density of the negative electrode and claim 19 introduces new subject matter relating to the inclusion of vinylene carbonate in the non-aqueous electrolyte. No international search was carried out with respect to either of these technical features in the international search report.